CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter will review the technique and method that used to this study to achieve the study's objective successfully. This will be consist three phase which are collecting information and materials, sawdust lightweight concrete production and the testing of samples.

3.2 Research Phase (Collecting Information and Materials)

Literature reviews from the previous study was done to find out more related information and to understand more about the sawdust concrete. The material like cement, sand and lime is prepared by the university laboratory. In this study, sawdust is completely replacing the coarse aggregate with the ratio 1:1:3 and 1:1:0.5:2.5. Sawdust is obtained from Kilang Papan Aman at Gambang, Kuantan, Pahang. Then, the cockleshell is collected at Warung Nasi Lemak Kerang at Taman Tas, Kuantan.

3.3 Preparation of Samples

Firstly, sawdust will undergo pre-treatment by using lime solution. Prepare the material and equipment for the laboratory testing before the work done. For the equipment, check with the lab assistance about the condition of the machine. For this study, compression test machine, sieve set, mechanical sieve shaker, weight scale and CCA Cube Press (Cinva Ram) will be used.

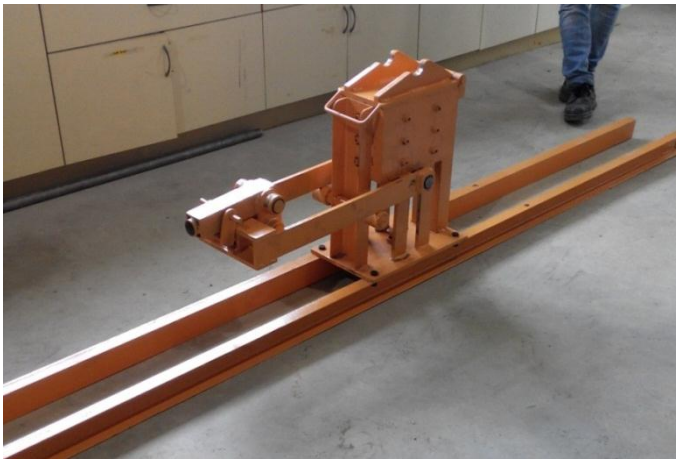

Figure 3.1 Cinva Ram

For the materials, the mix ratio 1:1:3 (cement:sand:sawdust). Cube size that will be used is 100mm x 100mm x 100mm. Cube production are by compaction by using the Cinva Ram. The curing stage is at 7days and 28 days. All samples will be cured by the saturated wet covering method. In this method moisture retaining fabrics; gunny sacks are used as wet covering to keep the concrete in a wet condition during the curing period. This water dissolves the extractive materials that retard the hardening process. All samples are prepared using the ratio of:

a) 1:1:3 control sample (cement: sand: non-treated sawdust)
b) 1:1:3 treated sample (cement: sand: treatment sawdust)
c) 1:1:0.5:2.5 (cement: sand: soil: non-treated sawdust)
d) 1:1:0.5:2.5 (cement: sand: soil: treated sawdust)
e) 1:1:0.5:2.5:0.33 (cement: sand: soil: non-treated sawdust: cockleshell)
f) 1:1:0.5:2.5:0.67 (cement: sand: soil: non-treated sawdust: cockleshell)
g) 1:1:0.5:2.5:0.10 (cement: sand: soil: non-treated sawdust: cockleshell)

Table 3.1 Mix Design for the Samples

	Cement	**Sand**	**Soil**	**Sawdust**	**Cockleshell**
NT-Control	1	1		3	
	1041.70	1380.25	-	1351.80	-
	1042.50	1402.10	-	1362.72	-
	1022.00	1370.21	-	1521.02	-
T-Control	1	1		3	
	1076.83	1331.79	-	1545.34	-
	1056.84	1332.24	-	1569.74	-
	1032.47	1355.72	-	1611.14	-
NT-Soil	1	1	0.5	2.5	
	1018.40	1339.06	461.32	1278.25	-
	1042.21	1346.62	460.04	1238.53	-
	1031.63	1326.89	461.28	1287.91	-
T-Soil	1	1	0.5	2.5	
	1045.98	1344.46	479.75	1297.57	-
	1015.58	1316.27	449.24	1279.31	-
	1073.07	1337.14	454.12	1269.92	-
CS – 0.33	1	1	0.5	2.5	0.33
	1040.00	1450.99	479.48	1356.31	467.10
	1073.70	1467.61	486.20	1390.75	464.10
	1076.44	1483.32	474.12	1378.19	461.60
CS - 0.67	1	1	0.5	2.5	0.67
	1075.92	1486.14	483.56	1333.44	953.90
	1019.50	1487.64	456.87	1328.04	929.38
	1018.89	1435.18	455.26	1347.95	957.25
CS – 1.00	1	1	0.5	2.5	1.00
	1033.61	1327.97	446.04	1281.16	1414.01
	1053.52	1316.55	466.93	1341.26	1409.29
	1080.28	1309.33	470.18	1334.72	1443.41